

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

MARK JONES & PAMELA JONES, §
§
Plaintiffs, §
§
v. § Case No. 2:14-cv-694-RWS-RSP
HARLEY-DAVIDSON, INC. HARLEY- §
DAVIDSON MOTOR COMPANY §
GROUP, LLC, §
§
Defendants. §

MEMORANDUM ORDER

Pending before the Court is Plaintiffs Mark Jones and Pamela Jones' ("the Joneses") Motion to Strike the Testimony of Defendants Harley-Davidson, Inc. and Harley-Davidson Motor Company Group, LLC's ("Harley-Davidson") Expert, David R. Thom. (Dkt. No. 62.) The Joneses assert that Mr. Thom's testimony is neither relevant nor reliable. Harley-Davidson counters that the Joneses' "attacks on Thom's opinions and testimony go to the weight rather than the admissibility of the evidence" (Dkt. No. 70 at 6.) The Court has considered the arguments and finds that Mr. Thom's testimony will be only partly excluded.

APPLICABLE LAW

Rule 702 provides that an expert witness may offer opinion testimony if (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case. Fed. R. Evid. 702.

“The inquiry envisioned by Rule 702 is . . . a flexible one,” but in *Daubert*, the Supreme Court held the Rules also “assign to the trial judge the task of ensuring that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand.” *Daubert v. Merrell Dow Pharmas. Inc.*, 509 U.S. 579, 594, 597 (1993). “The relevance prong [of *Daubert*] requires the proponent [of the expert testimony] to demonstrate that the expert’s ‘reasoning or methodology can be properly applied to the facts in issue.’” *Johnson v. Arkema, Inc.*, 685 F.3d 452, 459 (5th Cir. 2012) (quoting *Curtis v. M & S Petroleum, Inc.*, 174 F.3d 661, 668 (5th Cir. 1999)). “The reliability prong [of *Daubert*] mandates that expert opinion ‘be grounded in the methods and procedures of science and . . . be more than unsupported speculation or subjective belief.’” *Johnson*, 685 F.3d at 459 (quoting *Curtis*, 174 F.3d at 668).

In assessing the “reliability” of an expert’s opinion, the trial court may consider a list of factors including: “whether a theory or technique . . . can be (and has been) tested,” “whether the theory or technique has been subjected to peer review and publication,” “the known or potential rate of error,” “the existence and maintenance of standards,” and “general acceptance” of a theory in the “relevant scientific community.” *Daubert*, 509 U.S. at 593–94; *see also Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 150 (1999) (“*Daubert* makes clear that the factors it mentions do *not* constitute a ‘definitive checklist or test.’”); *U.S. v. Valencia*, 600 F.3d 389, 424 (5th Cir. 2010). “The proponent need not prove to the judge that the expert’s testimony is correct, but she must prove by a preponderance of the evidence that the testimony is reliable.” *Johnson*, 685 F.3d at 459 (quoting *Moore v. Ashland Chem., Inc.*, 151 F.3d 269, 276 (5th Cir. 1998) (en banc)).

ANALYSIS

A. Reliability Challenges

The Joneses assert that Mr. Thom's testimony is not reliable for three reasons. First, the Joneses point out that Mr. Thom used the National Operating Committee on Standards for Athletic Equipment ("NOCSAE") head form to conduct motorcycle helmet tests. The Joneses state the NOCSAE head form is intended to be used for athletic helmets tests, and accordingly, "there is not widespread acceptance of his method within the relevant community of experts." (Dkt. No. 62 at 6.) Second, the Joneses contend that Mr. Thom's tests have an unverifiable margin of error. "Thom conducted only a single drop for each [] scenario" which prevents the Joneses from confirming if his "test was capable of reproduction within a reasonable rate of error." (Dkt. No. 62 at 6.) Finally, the Joneses assert that "Thom provides no evidence [] his apparatus was properly calibrated prior to his testing." (Dkt. No. 62 at 7.) The Joneses assert Mr. Thom's apparatus was likely improperly calibrated because his results show an "inexplicable" difference in peak linear acceleration based on the initial velocity. (*See* Dkt. No. 62 at 7.)

Harley-Davidson responds to each of these points. First, Harley-Davidson states that the NOCSAE head form is "widely accepted and used nationally for testing the effectiveness of all helmets with regard to protecting the human head." (Dkt. No. 70 at 6.) Harley-Davidson contends that although magnesium, not NOCSAE, head forms are used in Department of Transportation ("DOT") compliance testing, NOCSAE head forms are more appropriate for "demonstrat[ing] how a helmet affects a human head, particularly under the circumstances of this crash." (Dkt. No. 70 at 7.) Harley-Davidson asserts that the NOCSAE head form "respond[s] to impact in a manner much more similar to [that of an] actual [person] than the magnesium headforms used for standard DOT compliance testing." (Dkt. No. 70 at 7.) Second, Harley-Davidson contends

that it is not necessary to perform more than one drop test as the “potential rate of error” in the test is “in the single digit percentage range,” whereas, the measurable acceleration reduction is in the “1:3 or 1:4” range. (Dkt. No. 70 at 8.) Finally, Harley-Davidson states Mr. Thom provided a report which shows that he “properly documented complete pre and post-test calibration system checks.” (Dkt. No. 70 at 8.) Harley-Davidson also notes that the difference in peak accelerations is expected. (See Dkt. No. 70 at 9.)

The Court finds Harley-Davidson has shown Mr. Thom’s testimony is sufficiently reliable. As to Mr. Thom’s use of the NOCSAE head form, the Court finds that Harley-Davidson has shown there is a reasonable basis for using this head form instead of a magnesium head form. Harley-Davidson says that magnesium head forms are not suitable for impact tests because the impact to a magnesium head does not mimic the impact to a human head. The Joneses cite no evidence showing this reasoning is invalid. Furthermore, just as “[p]ublication . . . is not a *sine qua non* of admissibility,” *Daubert*, 509 U.S. at 593, Harley-Davidson’s failure to conduct its test in a manner consistent with related government protocols is not dispositive of the test’s admissibility under Rule 702.

As to Mr. Thom’s failure to perform multiple test runs, the Court finds that this does not cause his testimony to be unreliable. Mr. Thom implies testing in this field is generally consistent because the variance between runs is small and the values being measured are large. (See Dkt. No. 70 at 8 (“The ‘potential rate of error’ will be in the single digit percentage range while the acceleration of a helmet is 1:3 or 1:4.”).) The Court notes that the inability of the opposing party to confirm a margin of error is not a consistent basis for finding an expert’s testimony unreliable. *Daubert* holds that techniques with high rates of error may need multiple runs to generate reliable data, but *Daubert* does not hold that reliable techniques must always be

repeated. *See Dabuert*, 509 U.S. at 594 (“[I]n the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error and the existence and maintenance of standards controlling the technique’s operation.”) (citation omitted).

Finally, as to Mr. Thom’s alleged failure to calibrate the apparatus, the Court notes that the Joneses have abandoned this challenge in their reply. (*See* Dkt. No. 86 at 2.) Plaintiffs, however, continue to assert Mr. Thom’s methods are unreliable because a 4.4% difference in velocity cannot yield a 64% difference in peak linear acceleration. (*See* Dkt. No. 86 at 2 (“The difference in velocity between the single drop of the unhelmeted Mr. Jones head form and the single drop of the unhelmeted Mrs. Jones head form was approximately 4.4%. Yet, these two drops yielded a surprising 64% difference in peak linear velocity [sic].”)) (citation omitted). Specifically, Plaintiffs argue: “According to Newton’s Second Law of Motion, acceleration is independent of mass. Therefore, all other things being equal, similar peak linear accelerations would be expected between the two unhelmeted drops despite the fact that Mr. Jones’ head form weighed more than Mrs. Jones’ head form.” (Dkt. No. 86 at 2.)

The Court finds that these arguments lack merit. It starts from first principles. “A lot of words are used in physics, and they all have precise meanings in physics, although they may not have such precise meanings in everyday language.” R. Feynman et al., *The Feynman Lectures on Physics Volume I*, at 9-1 (2010). For example, velocity represents the rate of change of an object’s position with respect to time, *id.* at 8-6, and “[a]cceleration is defined as the time rate of change of velocity,” *id.* at 8-8.

A real-world scenario explains this relationship. “You may have heard with great excitement about some car that can get from rest to 60 miles an hour in ten seconds flat. From such a performance we can see how the speed changes, **but only on the average.**” *Id.* (emphasis

added). In other words, the net change in velocity over a period of time is proportional to the **average** acceleration over that period, but it is not necessarily proportional to the **peak** or maximum acceleration during that period.

Thus, if two objects begin at rest and, ten second later, are traveling at the same speed, their average acceleration over the ten seconds is the same. However, their peak accelerations during the period might have been different (e.g. one object may have rolled down a hill and the other may have been fired from a slingshot). Applying these concepts to the facts of this case, a 4.4% difference in initial velocity between Mr. Thom's two tests will produce a proportional difference in average acceleration but will not necessarily produce a corresponding relationship between peak accelerations.

Furthermore, contrary to the Joneses' arguments, Newton's Second Law of Motion does not say "acceleration is independent of mass." (Dkt. No. 86 at 2.) In fact, Newton's Second Law of Motion says the opposite:

Newton's second law of motion can be formally stated as follows: The acceleration of an object as produced by a net force is directly proportional to the magnitude of the net force, in the same direction as the net force, and **inversely proportional to the mass of the object.**¹

Thus, consistent with Newton's Second Law, if two objects impact the ground at the same velocity, a more massive object will require a greater stopping force than a less massive object to produce the same average deceleration over the time period of impact. This difference in forces (resulting in different stresses on the structures of the helmets) is one plausible explanation for the differences in the peak accelerations that Mr. Thom measured. In sum,

¹ See <http://lmgtfy.com/?q=Newton+Second+Law+of+Motion> (emphasis added). The mathematical formulation of Newton's Second Law also relates mass " m " and acceleration " a ." Feynman Lectures at 9-2 (" $F = m \frac{dv}{dt} = ma$.").

Harley-Davidson has shown that Mr. Thom's results are sufficiently reliable and they are not inconsistent with the laws of physics.

B. Relevance Challenges

The Joneses assert that Mr. Thom's testimony is not relevant for three reasons. First, the Joneses state that Mr. Thom used the wrong sized helmets in his tests. This makes a difference because the helmets the Joneses were wearing during the accident had a thicker inner lining and purportedly better impact absorbing properties. (Dkt. No. 62 at 8.) Second, the Joneses assert that Mr. Thom used the wrong drop height in his tests. The Joneses say that Mr. Thom, without explanation, increased the drop height in the simulation by nine inches from the Joneses' seating height during the accident. (Dkt. No. 62 at 9.) Finally, the Joneses point out Mr. Thom accounted for linear acceleration but not rotational acceleration. The Joneses state that this makes his tests irrelevant because rotational acceleration contributes significantly to traumatic brain injury. (*See* Dkt. No. 62 at 10.)

Harley-Davidson responds to each of these points. First, Harley-Davidson notes that the only difference between the helmets in the test and the helmets in the accident is the thickness of the comfort padding which, according to Harley-Davidson, has no impact attenuation properties. (Dkt. No. 70 at 11.) Second, Harley-Davidson asserts that Mr. Thom increased the drop height in order to "account for any increased fall height from vaulting and to provide conservative testing to demonstrate the helmets' protective effect." (Dkt. No. 70 at 11.) Finally, Harley-Davidson argues that measuring linear acceleration is standard procedure because as of "2016 there is no established method for laboratory testing of rotational acceleration for heads and helmets." (Dkt. No. 70 at 12; *see* Dkt. No. 70 at 12 ("No standard in the United States or internationally includes a test for rotational acceleration.").)

The Court finds that Mr. Thom's testimony is relevant to the case. Harley-Davidson has shown that Mr. Thom's helmet tests are relevant to the case because the helmets used in the test are acceptable proxies for the helmets in the accident. The parties do not dispute that the principal difference between the helmets is the thickness of the inner lining. Mr. Thom's declaration states that the lining has no impact attenuation properties. (*See* Dkt. No. 70-1 ¶¶10–11.) The Joneses have offered no evidence that contradicts this statement. For example, the Joneses' expert John D. Lloyd, says that “a larger helmet would have a thicker liner than the actual x-large helmet . . .” (Dkt. No. 62-1 at 45.) He does not, however, say a thicker liner would reduce the impact in an accident.

Harley-Davidson has also shown the heights Mr. Thom used in the drop tests are relevant to this case. Mr. Thom stated he increased the drop height in his tests by six inches to account for the accident being a “high-side” and not “low-side” accident. (*See* Dkt. No. 62-1 at 18–19.) The Joneses point out that there was no need to increase the drop height because Kevin Breen, Harley-Davidson's expert, stated that Mr. Jones “was not ejected during the overturn.” (Dkt. No. 64-3 at 13.)

The Court finds this challenge is directed at the weight of the evidence. The relevance factor of *Daubert* asks a court to determine if an expert's methodology can be applied to the facts of a case. *See Johnson*, 685 F.3d at 459. Here, the Joneses do not dispute “Mr. and Mrs. Jones were subjected to linear . . . acceleration in the crash” and that a drop test is a conventional way of measuring linear acceleration. (Dkt. No. 62 at 9.) No evidence suggests Mr. Thom's drop test methodology could not be applied to the facts of this case. That Mr. Thom allegedly applied improper “facts” to a proper methodology is an issue that should be challenged on cross-examination.

Finally, Harley-Davidson has shown Mr. Thom's tests are relevant to the case despite Mr. Thom accounting only for linear acceleration. Harley-Davidson states that Head Injury Criterion ("HIC") "is a very good predictor of all head injury," however, it is "[n]ot necessarily the best for [diffuse brain injuries] because that would be more of a rotational acceleration question." (Dkt. No. 62-1 at 23.) The Joneses do not directly challenge this characterization of linear and rotational acceleration. (*See* Dkt. No. 62 at 9–10.)

The Court finds Mr. Thom's testimony on these matters should not be excluded. The relevance factor of *Daubert* does not require an expert to account for all variables that can lead to a conclusion. It only requires an expert to use a method that can be applied to the facts of a case. Here, Mr. Thom has used a method that can be applied to the facts of this case because the parties do not dispute HIC readings can indicate the likelihood of brain injury. That a rotational acceleration can better indicate the likelihood of a diffuse brain injury does not show that Mr. Thom applied a method that is not suitable to the facts.

C. Beyond Expertise

The objection to Mr. Thom's testimony that does have force is that he is not qualified to testify on the precise medical benefits of wearing a helmet. The Court agrees that Mr. Thom lacks the necessary education and training to opine that "at most, the Joneses would have received "minor concussions" if they had been helmeted. He can testify that his investigation shows that their head injuries would likely have been less severe, but he lacks the qualifications to go beyond that to state what their injuries would have been.

CONCLUSION

For the reasons stated above, the Court finds that Defendants have shown Mr. Thom's testimony is relevant and reliable as to all issues except his testimony on the severity of the

Joneses head injuries had they been wearing helmets. Plaintiffs' Motion to Strike (Dkt. No. 62) is **GRANTED-IN-PART** as set forth above and **DENIED** as to all remaining issues.

SIGNED this 11th day of April, 2016.



ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE